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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARK VERLEYSEN

Appeal 2010-001435
Application 10/589,306
Technology Center 1700

Before ADRIENE LEPIANE HANLON, CHUNG K. PAK, and
PETER F. KRATZ, *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 13 through 16, all of the claims pending in the above-identified application.¹ We have jurisdiction under 35 U.S.C. § 6.

¹ See the Appeal Brief ("App. Br.") filed February 6, 2009, the Supplemental Appeal Brief ("Supp. Br.") filed March 27, 2009, the Examiner's Answer ("Ans.") filed July 24, 2009, and the Reply Brief ("Reply Br.") filed September 24, 2009.

STATEMENT OF THE CASE

The subject matter on appeal is directed to “the withdrawal of solid polyolefin from a slurry of such solids..., for example[,] from a stream of polymerization mixture continuously flowing in a loop reactor” (Spec. 1:3-6). Details of the appealed subject matter are recited in representative claims 13 and 14 reproduced from the Claims Appendix to the Appeal Brief as shown below:

13. A method for operating an olefin polymerization loop reactor system comprising:
 - introducing an olefin, a polymerization catalyst, and a diluent carrier liquid into a loop reactor, wherein the loop reactor comprises a circulating pump, a settling leg and a 180° rotating product take-off valve operably connected to the settling leg for the removal of polymer therefrom;
 - contacting the olefin with the polymerization catalyst in the presence of the diluent carrier liquid to form a slurry of polymer particles within the loop reactor; and
 - withdrawing polymer particles from the settling leg through the 180° rotating take-off valve, wherein the polymer particles are withdrawn from the settling leg at a predetermined time interval, the predetermined time interval adapted to provide for removal of substantially all polymer particles from the settling leg with substantially no removal of olefin and diluent from the loop reactor; and
 - maintaining the predetermined time interval by automatically controlling and adjusting air flow passing to the 180° rotating take-off valve for operation thereof, wherein the predetermined time interval is automatically controlled by a pneumatically driven double-acting actuator.
14. A polymerization process comprising;
 - polymerizing olefin monomer in a liquid diluent to produce a liquid slurry containing polymer particles within a loop reactor, wherein the loop reactor is operably connected to a first end of settling leg;
 - allowing the polymer particles to settle in the settling leg;

periodically opening a 180 degree rotating product take-off valve disposed at a second end of the settling leg to withdraw the polymer particles from the settling leg, wherein the product take-off valve is operated by a pneumatically driven double-acting actuator and the pneumatically driven double-acting actuator is regulated by a system comprising pneumatic control valves.

As evidence of unpatentability of the claimed subject matter, the Examiner relies upon the following prior art references (Ans. 4):

Hottovy	US 5,183,866	Feb. 2, 1993
Burns	US 5,455,314	Oct. 3, 1995
Tanifuji	US 5,462,998	Oct. 31, 1995

Appellant seeks review of the Examiner's rejection of claims 13 through 16 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Hottovy, Burns, and Tanifuji (App. Br. 3 and Supp. Br. 3).

FACTUAL FINDINGS, PRINCIPLES OF LAW, ISSUES, ANALYSES, AND CONCLUSIONS

Appellant does not dispute the Examiner's finding that:

Hottovy teaches an olefin polymerization process conducted in a loop reactor comprising conducting the olefin polymerization in the presence of a catalyst [and a diluent] in the loop reactor to provide a polymer slurry, accumulating [sic., accumulating] the polymer slurry in a settling leg, [periodically] pass[ing] the polymer slurry through a PTO [i.e., a product takeoff port,] valve on the settling leg to a flash chamber...for separating the polymer solid and the diluent (col. 4, lines 29-43). [(Compare Ans. 3 with App. Br. 3-5 and Rep. Br. 1-2.)]

Rather, Appellant contends that one of ordinary skill in the art would not have been led to employ a 180 degree rotating product take-off valve, which is operated by a pneumatically driven double-acting actuator

regulated by a system comprising pneumatic control valves, in the method of Hottovy to withdraw polymer solids from a settling leg as required by claims 14 through 16 (App. Br. 3-4 and Reply Br. 1-2).

Thus, with respect to claims 14 through 16, the dispositive question is: Would one of ordinary skill in the art have been led to employ a 180 degree rotating product take-off valve, which is operated by a pneumatically driven double-acting actuator regulated by a system comprising pneumatic control valves, in the method of Hottovy to withdraw polymer solids from a settling leg as required by claims 14 through 16 within the meaning of 35 U.S.C. § 103(a)? On this record, we answer this question in the affirmative.

As indicated *supra*, Hottovy teaches periodically withdrawing a slurry containing polymer solids from a settling leg via a PTO [i.e., a product takeoff port,] valve. Although Hottovy does not specifically mention that its PTO (product take-off) valve is the claimed 180 degree rotating product take-off valve which is operated by a pneumatically driven double-acting actuator regulated by a system comprising pneumatic control valves, Appellants do not dispute the Examiner's finding that Tanifuji teaches using a 180 degree rotating ball valve for removing a slurry containing polymer solids to reduce the deposition of polymer scale and suppress the formation of polymer blocks. (*Compare* Ans. 3-4 with App. Br. 3-5 and Reply BR. 1-2.) Nor have Appellants specifically challenged the Examiner's official notice that "[i]t is the industrial standard to use a double-acting actuator to control the valve." (*Compare* Ans. 3 with App. Br. 3-5 and Reply Br. 1-2.) Burns also teaches using a V-notched ball valve, together with a pressure (pneumatic) responsive control system, to automatically operate the removal

of a slurry containing particular polymer solids in a loop reactor periodically (col. 1, ll. 5-25 and col. 1, l. 55 to col. 3, l. 38). Consistent with the teachings of Tanifuji and Burns, Appellants further acknowledge at page 3, lines 14-19, of the Specification that:

Two types of PTO valves are in use. *The most common* relies on a 180° rotation of the moving part of the valve, whereby the valve turns from closed (0°) to open (90°) then closed (180°); during the next cycle, the valve rotates backwards. Valves with a 90° rotation are also in use, whereby the moving part turns from closed (0°) to open (90°) then backwards to closed (0°). [(Emphasis added.)]

Given the above teachings², we concur with the Examiner that one of ordinary skill in the art would have been led to utilize either the claimed 180 degree rotating ball valve taught by Tanifuji or the 90 degree rotating V-notched ball valve taught by Burns, together with a double-acting actuator and a pressure (pneumatic) responsive control system, as the PTO valve system in the method of Hottovy, with a reasonable expectation of successfully automatically controlling the periodic withdrawal of a slurry containing polymer solids from the settling leg of a loop reactor. *KSR Int'l. Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007)(quoting *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 282 (1976))("[W]hen a patent 'simply arranges old

²"[A] prior art reference must be 'considered together with the knowledge of one of ordinary skill in the pertinent art.'" *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (quoting *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)). The knowledge available to a person having ordinary skill in the art includes facts admittedly well known in the art. *See In re Nomiya*, 509 F.2d 566, 570-71 (CCPA 1975)(The admittedly known prior art in the Appellants' Specification may be used in determining the patentability of a claimed invention.).

elements with each performing the same function it had been known to perform' and yields no more than one would expect from such an arrangement, the combination is obvious.'")

On this record, Appellants have not shown that these common PTO valves, inclusive of the claimed 180 degree rotating ball valve taught by Tanifuji, used for opening and closing passages to permit the periodic flow of a slurry containing polymer solids would not have been useful for periodically passing a slurry containing polymer solids from the settling leg of Hottovy's loop reactor via opening and closing.

Accordingly, based on the totality of record, including due consideration of Appellants' arguments in the Appeal Brief and the Reply Brief, we determine that the preponderance of the evidence weighs most heavily in favor of obviousness of the subject matter recited in claims 14 through 16 within the meaning of 35 U.S.C. § 103(a).

Appellants also contend that the Examiner has not shown that the prior art references relied upon teach or would have suggested, *inter alia*, withdrawing polymer solids with substantially no removal of olefin and diluent as required by claim 13 (App. Br. 4).

With respect to claim 13, the dispositive question is: Has the Examiner shown that the prior art references relied upon would have suggested to one of ordinary skill in the art to withdraw polymer solids with substantially no removal of olefin and diluent as required by claim 13? On this record, we answer this question in the negative.

As discussed *supra*, Hottovy, Burns, and Tanifuji are directed to removing *a slurry* containing polymer solids, diluents and possibly olefin through PTO valves. Nowhere has the Examiner explained why and how one of ordinary skill in the art would have been led to remove polymer solids with substantially no olefin and diluent. Thus, we concur with Appellants that the Examiner has not shown that the prior art references relied upon teach or would have suggested withdrawing polymer solids with substantially no removal of olefin and diluent as required by claim 13.

Accordingly, the Examiner has not supplied sufficient reasoning or facts in the Answer to establish a prima facie case of obviousness regarding the subject matter recited in claim 13 within the meaning of 35 U.S.C. § 103(a).

ORDER

Upon consideration of the record, and for the reasons set forth in the Answer and above, it is

ORDERED that the decision of the Examiner to reject claims 14 through 16 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Hottovy, Burns, and Tanifuji is AFFIRMED;

FURTHER ORDERED that the decision of the Examiner to reject claim 13 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Hottovy, Burns, and Tanifuji is REVERSED; and

FURTHER ORDERED that no time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

Appeal 2010-001435
Application 10/589,306

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